



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US97/01811 <b>(22) International Filing Date:</b> 31 January 1997 (31.01.97) <b>(30) Priority Data:</b> 08/599,217      9 February 1996 (09.02.96)      US <b>(71) Applicant (for all designated States except US):</b> MATTEL, INC. [US/US]; 333 Continental Boulevard, El Segundo, CA 90245-5012 (US). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> RIFKIN, Andrew [-/US]; 917 Via Mirada, Palos Verdes, CA 90274 (US). <b>(74) Agent:</b> EKSTRAND, Roy, A.; Mattel, Inc., 333 Continental Boulevard, MS M1-1518, El Segundo, CA 90245-5012 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> REMOTE CONTROL WAND FOR COMPUTER VIDEO GAME INTERACTION <b>(57) Abstract</b> <p>An infrared coupled remote computer mouse is supported within an elongated wand-like housing (30) having a plurality of D pad switches and an infrared transmitting mechanism (17). The computer includes an infrared receiver for receiving and converting the infrared transmitted signals from the mouse. An additional gravity or momentum actuated switch (16) is provided in combination with the conventional D pad to facilitate a double click signal output from the wand each time the wand is rapidly moved or flicked to provide a "magical" reaction in the computer video game being played.</p> <div data-bbox="1161 1155 1404 1921" data-label="Image"> </div>		

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## REMOTE CONTROL WAND FOR COMPUTER VIDEO GAME INTERACTION

## SPECIFICATION

Field of the Invention

5        This invention relates generally to computer systems and particularly to apparatus for playing video computer games.

Background of the Invention

10        Computer systems have developed with astounding sophistication in recent years to the point where so-called personal computers or "PC's" have developed into extremely powerful and sophisticated computers. While the fabrication of such computers has enjoyed some variation, generally all possess the same basic elements  
15        which include a processor unit typically supporting one or more disk drives and CD-ROM disk inputs for assimilating information together with a keyboard for user inputs and a monitor for display. The latter is typically a cathode ray tube display device similar to a  
20        television display. The keyboard is similar to a conventional typing keyboard with additional keys or command input provided. In addition to the basic computing system, most PC's also provide a mouse input which couples to a small input device rested upon a mouse  
25        pad or other convenient surface. A typical computer mouse includes a generally curved oval device having a flat underside resting upon the mouse pad. A rotatable ball supported within a trackball assembly is interposed between the mouse undersurface and mouse pad such that  
30        movements of the mouse across the mouse pad causes rotation of the trackball in turn providing data to be communicated to the computer processor. The typical

mouse further includes a pair of depressible "click" switches or buttons which are actuated by the user's fingers. In its typical application, the mouse cooperates with the processor system in manipulating a movable pointer or cursor upon the display to various elements of the displayed image which may then be selected or otherwise manipulated by pressing one or more of the click switch buttons. The device has substantially improved the friendliness and user interface of computer systems when coupled with powerful software to present the user with simplified operation in the form of "point and click" manipulation of the mouse and on-screen pointer. Within the processor, software systems are operative to translate the combinations of trackball signals in response to mouse movement and the manipulation of the click switches to the necessary commands for operating the system.

A relatively new improvement in such computer mouse design utilizes a cordless mouse which communicates with the computer processor via an infrared or IR transmission link. In such a system, a mouse-type unit having a plurality of depressible buttons supports an infrared transmitter together with appropriate circuitry for encoding the various switch actuation combinations to data which may be transmitted from the infrared transmitter to a receiver coupled to the computer processor. At the receiver, the infrared transmitted data is received and converted to appropriately formatted data which may be utilized by the processor via its mouse input. In a typical remote mouse apparatus, a standard four button D pad is provided for actuation by the user. Manipulating the D pad buttons actuates corresponding D pad switches to provide information generally referred to as "clicks". Generally speaking, the clicks provided by the four D pad switches correspond in various combinations to the type of information communicated to

the processor via trackball movement and click switch actuation of a conventional mouse. In addition, information is communicated at a second level in the form of "double clicks" which are differently interpreted by the processor.

Such remote mouse devices have proven to be an amusing and entertaining device for computer users. Of particular interest is the use of such remote mouse devices in the playing of computer games. The ability of the player to be distanced from the computer while using the remote mouse has proven to be an enhancement of the game play effect on many occasions.

Despite the improvement of such remote mice, there remains nonetheless a continuing need in the art for evermore amusing, entertaining and useful input devices for use in playing computer games.

#### Summary of the Invention

Accordingly, it is a general object of the present invention to provide an improved remote control wand for computer video game interaction. It is a more particular object of the present invention to provide an improved remote control wand for computer video game interaction which facilitates a dramatic game play association between operation of the remote control wand and the computer game.

In accordance with the present invention, there is provided for use in combination with a computer having a remote control receiver, a remote control wand comprising: a housing; a keypad having user depressible keys supported by the housing; a transmitter coupled to the keypad for receiving input commands in the form of depressed ones of the keys and for transmitting an

encoded signal to the remote control receiver; and a movement actuated switch in the housing coupled to the transmitter providing an input signal thereto in response to movement of the housing.

5 Brief Description of the Drawings

The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with  
10 further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

Figure 1 sets forth a block diagram of a remote  
15 control wand constructed in accordance with the present invention;

Figure 2 sets forth a top view of the present invention remote control wand; and

Figure 3 sets forth a side view of the present  
20 invention remote control wand.

Description of the Preferred Embodiment

Figure 1 sets forth a block diagram of a remote control wand for computer video game interaction generally referenced by numeral 10. For purposes of  
25 illustration, wand 10 is shown enclosed within a dashed-line border within which a conventional D pad switching apparatus 11 is supported. D pad 11 is constructed entirely in accordance with conventional fabrication techniques and includes a quartet of D switches 12, 13,  
30 14 and 15. D pad 11 is coupled to an infrared

transmitting circuit 17 which includes conventional apparatus for converting the switch combination input from D pad 11 to a suitably encoded and formatted infrared light energy beam referenced by numeral 18. The combination of D pad 11 and infrared transmitter 17 may be fabricated entirely in accordance with conventional fabrication techniques and is operative to communicate data from user inputs in the form of various combinations of switch actuation of D pad 11 to a computer such as computer 20. Computer 20 includes an infrared receiver 21 coupled thereto by a coupling 22. The combination of computer 20 and infrared receiver 21 together with coupling 22 may be fabricated in accordance with conventional fabrication techniques. As infrared beam 18 is received by infrared receiver 21, a conversion is performed upon the encoded infrared data to provide a correspondingly formatted and encoded data stream which is coupled to computer 20 for processing in the above-described manner.

In accordance with the present invention, wand 10 further includes a G switch 16 having a momentum responsive switch mechanism which unlike D pad 11 responds solely to rapid movement of wand 10. Thus, G switch 16 is not directly accessible by the user as is the case for switches 12 through 15 but rather is solely actuated in an indirect manner by the user in rapidly moving or abruptly stopping the motion of wand 10. G switch 16 is operatively coupled to transmitter 17 such that actuation of G switch 16 provides a "double click" input to transmitter 17. When G switch 16 is actuated, transmitter 17 provides an appropriately encoded data segment for application to infrared beam 18 which corresponds to a double click signal input.

In the preferred operation of the present invention remote control wand, the user is able to hold wand 10 at

an appropriate distance from infrared receiver 21 and computer 20 and using D pad 11 manipulate the operation of computer 20 by providing various input controls. This interaction between wand 10 and computer 20 is  
5 substantially conventional and carried forward in the same general manner as conventional infrared remote mouse activities.

In addition, however, and in accordance with an important aspect of the present invention, the user is  
10 also able to exercise a physical movement of wand 10 to activate G switch 16 and produce a double click output signal. In the anticipated use of the present invention remote control wand, the user in playing a computer game is able to manipulate the computer game using D pad  
15 switches 12 through 15 and in a "magical" interaction is able to wave or flick the wand to actuate G switch 16. This action results in a double-click input and in accordance with the game play software within computer 20 a dramatic change in the display. Thus, for example, the  
20 child user may flick wand 10 in the manner characteristic of a magic wand and observe a dramatic change such as disappearance of an image from the display of computer 20.

Figure 2 sets forth a top view of a remote control  
25 wand for computer video game interaction constructed in accordance with the present invention and generally referenced by numeral 30. Remote control wand 30 is fabricated in a fanciful manner to provide an appearance generally suggestive of a magic wand. It will be  
30 apparent, however, that other fanciful appearances may be utilized for the present invention remote control wand. Remote control wand 30 includes a handle 31 coupled to a D pad 32. Wand 30 further includes an elongated shaft 40



extending from handle 31 and terminating in a star-shaped head 41. Head 41 may include one or more infrared sending units 42 or 43 (the latter seen in Figure 3) on either side thereof. Alternatively, an infrared sending unit may be positioned on the lower surface of D pad 32 such as shown by unit 44 in Figure 3. D pad 32 includes a plurality of D pad buttons 33, 34, 35 and 36 which are depressible to operate D pad switches 12 through 15 respectively (seen in Figure 1). An infrared transmitter 17 is shown in dashed-line representation and is preferably supported within remote control wand 30. In accordance with conventional fabrication techniques, transmitter 17 is operatively coupled to the infrared senders such as sender 40 and D pad 32 to provide the above-described operation. In accordance with the present invention, wand 30 further includes a G switch 16 shown in dashed-line representation which is operatively coupled to infrared transmitter 17 in the above-described relationship.

Figure 3 sets forth a side elevation view of remote control wand 30 having a handle 31 supporting a D pad 32, a shaft 40 and a head 41. As is described above, wand 30 supports one or more infrared sending units such as infrared senders 42, 43 or 44 alone or in combination as desired. As is also described above, D pad 32 includes a plurality of depressible buttons such as buttons 33 and 34. Infrared transmitter 17 and G switch 16 are supported within wand 30 as shown by dashed-line representation. Once again, it will be understood that appropriate electrical connection (not shown) utilizing conventional wiring techniques or their equivalents operatively couples D pad 32, G switch 16, infrared transmitter 17, and the plurality or selected one of infrared senders 42, 43 or 44.

In operation, the user grasps handle 31 and utilizes various combinations of D pad 32 to produce the desired commands which are communicated to the computer in the form of infrared coded data as described above. In addition and in further accordance with the present invention, the user then waves or snaps wand 30 to actuate G switch 16 and produce a double click encoded signal which is also communicated to the computer.

The communication protocol utilized by wand 30 may be carried forward using a variety of conventional protocols. For purposes of illustration, the present invention remote control wand utilizes the following protocol.

Wand 30 uses a three-byte/two-button protocol in which serial data is transmitted at 1200 baud, 7 bits, no parity, 1 stop bit. Data is transmitted only when a change of state of a button, or continuously when a D pad switch is activated. The data is arranged as follows:

Byte 1

20	D7	Not used
	D6	Logical 1 (identifies byte 1)
	D5	Left Switch Button: 1 = On
	D4	Right Switch Button: 1 = On
	D3	Y7
25	D2	Y6
	D1	X7
	D0	X6

Byte 2

30	D7	Not used
	D6	Logical 0
	D5	X5
	D4	X4
	D3	X3
35	D2	X2
	D1	X1
	D0	X0

Byte 3

5                   D7    Not used  
                  D6    Logical 0  
                  D5    Y5  
                  D4    Y4  
                  D3    Y3  
                  D2    Y2  
                  D1    Y1  
                  D0    Y0

10           X0 through X7 = change in X position. Two's  
compliment + = movement to right, - = movement to left.  
Y0 through Y7 = change in Y position. Two's compliment +  
= movement down, - = movement up. The wand produces two  
speeds when the D pad switches are activated. The value  
15 of X or Y is normally +-2. If button 3 (speed) is  
depressed, the value changes to +-5. One X and one Y  
switch may be active at the same time.

The wand left and right switches active once per  
state change, ie. The button down code will be sent once  
20 when the switch is pressed, and once when the switch is  
released. If a D pad switch is active, the actual state  
of the left and right buttons are transmitted. The wand  
also contains a "G" switch which causes a double click  
message to be sent in the form of left button down, left  
25 button up, delay left button down, left button up.  
Cursor movement is suspended during the double click  
transmission.

What has been shown is a remote control wand for  
computer video game interaction which utilizes a remote

controlled infrared coupled D pad and transmitter  
combination together with a gravity or momentum actuated  
G switch to provide a novel play characteristic in which  
the user simply waves or flicks the wand in order to  
5 produce a dramatic effect at the game play computer.

While particular embodiments of the invention have  
been shown and described, it will be obvious to those  
skilled in the art that changes and modifications may be  
made without departing from the invention in its broader  
10 aspects. Therefore, the aim in the appended claims is to  
cover all such changes and modifications as fall within  
the true spirit and scope of the invention.

THAT WHICH IS CLAIMED IS:

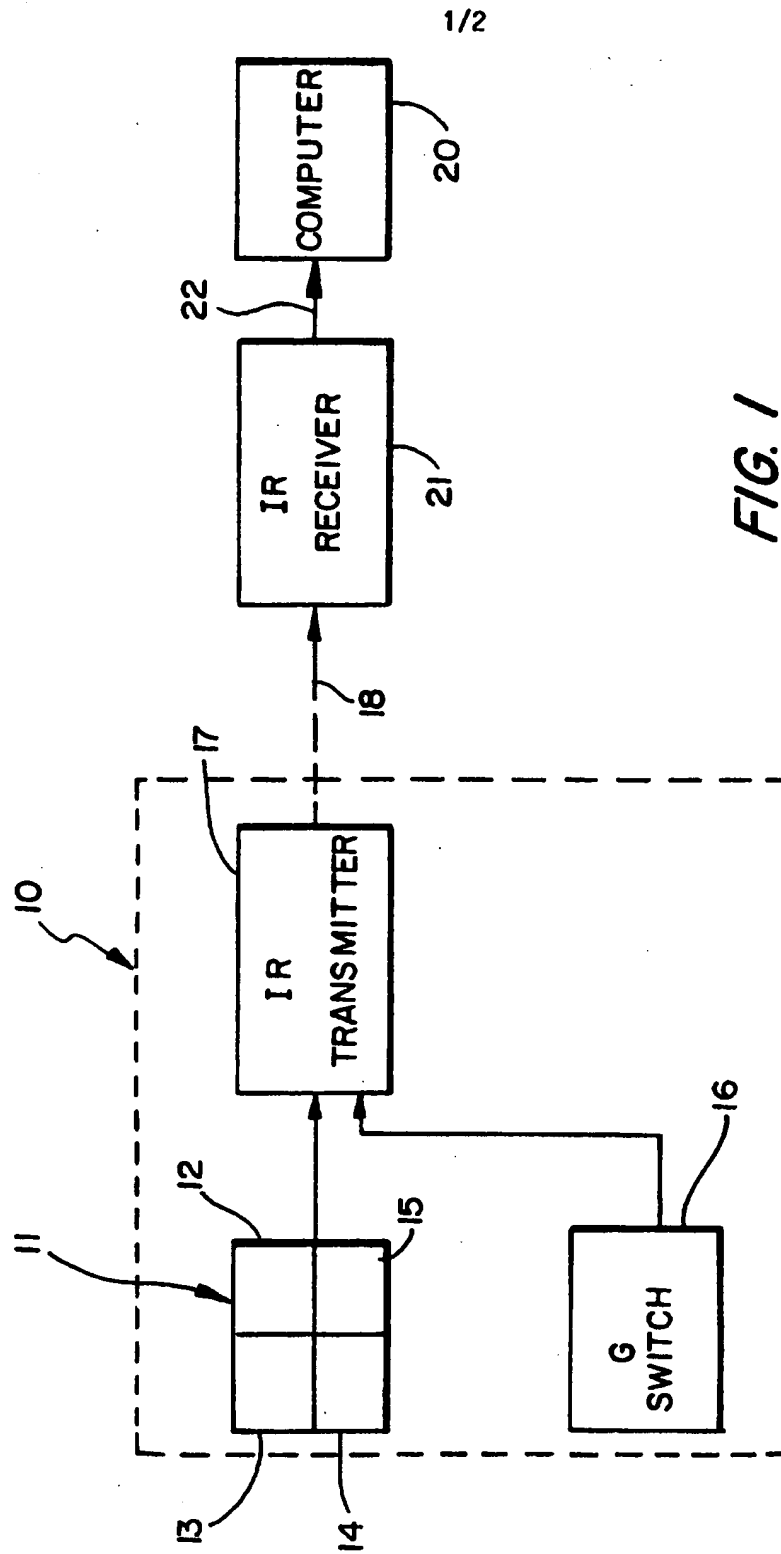
1. For use in combination with a computer having a remote control receiver, a remote control wand comprising:

5                   a housing;

                  a keypad having user depressible keys supported by said housing;

                  a transmitter coupled to said keypad for receiving input commands in the form of depressed ones of  
10 said keys and for transmitting an encoded signal to said remote control receiver; and

                  a movement actuated switch in said housing coupled to said transmitter providing an input signal thereto in response to movement of said housing.



2/2

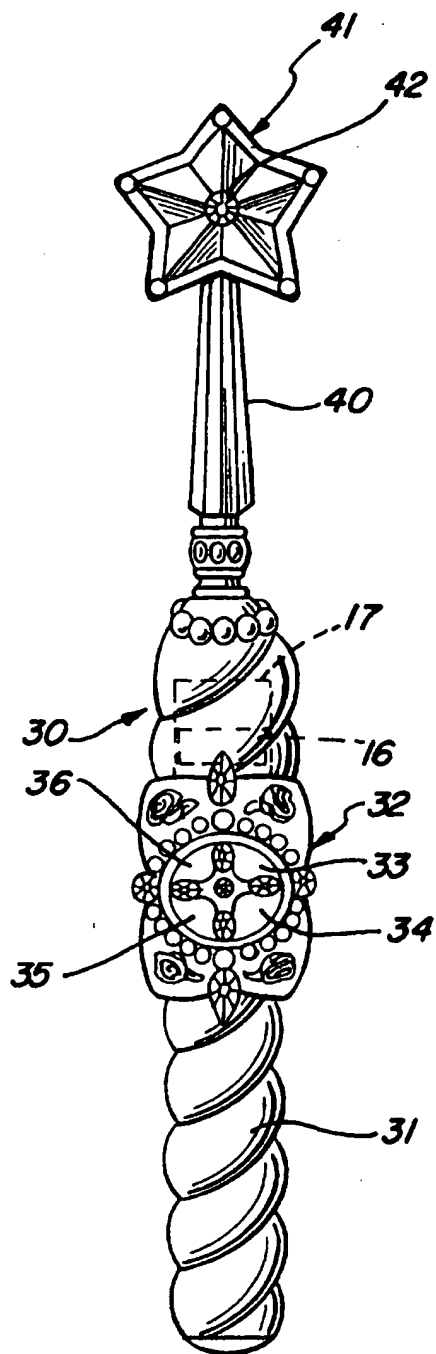


FIG. 2

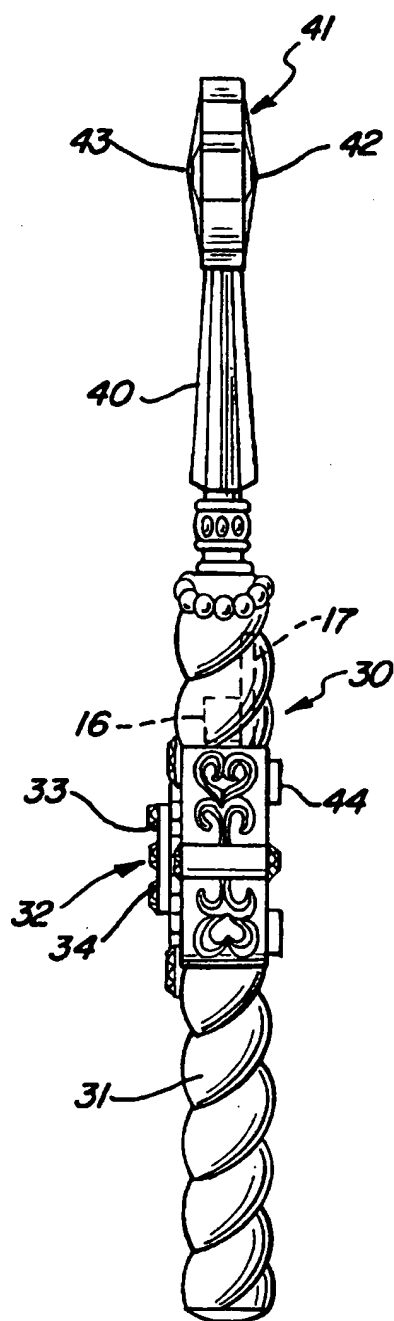


FIG. 3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US97/01811

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A63F 9/00

US CL :463/37, 47

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 463/37, 47

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
395/156-158; 463/36, 38

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,232,223 A (DORNBUSCH) 03 August 1993, entire document.	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

29 MARCH 1997

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